



RESEARCH ARTICLE.....

Mosquito dol Nets of Ratnagiri, Maharashtra

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ABSTRACT..... *Dol* net fishing is one of the popular fishing methods along the west coast of India. However, there are regional variations in their design, construction and operation. The present study deals with the general characteristics and design of *mosquito dol* nets operated in creeks of Ratnagiri, Maharashtra. The nets were made of webbing of polyethylene (PE) multifilament of 1.5 mm diameter with specifications of 210DX5X3 and having mesh size ranging from 150 to 8 mm. The nets were operated in the creek throughout the year in the depth ranging from 18 to 20 m.

KEY WORDS..... Design, General characteristics, *Mosquito dol* net, Polyethylene

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INTRODUCTION.....

Dol nets, owing to their simplicity in design, construction and operation remain as the popular gear especially in the traditional sector. Mechanization of the crafts and use of synthetic material for net fabrication have brought considerable changes in the structure and operation of *dol* nets at Versova, Mumbai (Raje and Deshmukh, 1989). The synthetic material polyethylene for net fabrication was first introduced in Versova in 1965 and due to its durability, light weight and easy maneuverability, it has almost replaced the earlier cotton twine nets, which were heavy, cumbersome and required time consuming tanning procedure. Similarly earlier coir ropes have been largely replaced by polyethylene ropes for the construction of bridle (*sus*) and the net. The present study is the first attempt on the documentation of the design and technical specifications of *mosquito dol* nets operated in the creeks of Ratnagiri.

RESEARCH METHODS.....

The study was carried out during the period August, 2011 to May, 2012. The detailed information regarding the design and construction of *mosquito dol* nets operated in the creeks of Ratnagiri was collected by physically sampling the units in operation. The data were recorded according to Sreekrishna and Shenoy (2001) and Akerman (1986) while the design of the gear was documented as per Nedelec (1975).

RESEARCH FINDINGS AND ANALYSIS.....

Technical specifications of *mosquito dol* nets operated in Ratnagiri are given in Table 1. Structure and design of a typical net is depicted in Fig. 1 and 2. In Ratnagiri, the main webbing of *mosquito dol* net was made up of PE multifilament of 1.5 mm diameter and specifications of 210DX5X3. Boopendranath and Hameed (2010) observed that in Kerala the material used for fabrication of stake nets was polyamide (PA) and

polypropylene (PP), while Sehara and Karbhari (1987) and Khan (1979) reported that PE monofilaments were used at Navabunder. Rao *et al.* (1993) stated that in Kakinada region of Andhra Pradesh the material used for the stake net was twisted cotton yarn.

Each section of the net was fabricated by joining rectangular pieces of webbing and the mesh size decreased from mouth to cod end *i.e.* from 150 at mouth to 8 mm at cod end with the hanging co-efficient in the range of 0.20 to 0.51. The mesh size along the length, were 149.96 ± 1.99 at mouth, 73.16 ± 1.60 at belly and at the cod end section it was 7.66 ± 0.35 . The numbers of meshes along the depth of the net were 55 ± 0.75 in mouth section, 268 ± 2.11 in belly section and 300 ± 4.30 in cod end section. Similarly, the numbers of meshes along the length in mouth, belly and cod end sections were 950 ± 11.61 , 900 ± 8.95 and 300 ± 3.95 , respectively. The horizontal hanging co-efficient at mouth was 0.50 ± 0.01 , at belly 0.20 ± 0.01 and at cod end section 0.51 ± 0.02 . The hung length and hung depth for each section varied from 0.52 to 3.43 m and 1.75 to 106.8 m, respectively.

Polypropylene rope of 4 mm diameter was most commonly used as head rope and foot rope. Head rope and foot rope were 7.5 m long and were fabricated by joining together six lines, each of 4 mm diameter made

of PP. Similarly, the side frame ropes of the mouth section, locally called as *kondur* were of same size and fabricated from the same material as head or foot rope, thus forming square section of the mouth. Anchor ropes (*Khuram*) used to tie the anchors to the net were 37.5 m in length and 14 mm in diameter made from PP. All the anchor ropes (4 to 5) were tied together to form a knot locally called as *Penda*. Four ropes each of length 40 m and 14 mm in diameter were joined to the *Penda* to form a bridle, of which two ropes locally called *sutar* were joined to the two loops locally called as *Khoba* at the two ends of the head rope of the net and the other two ropes locally called *pai* were joined to the two loops (*Khoba*) at the two ends of the foot rope of the net, at the time of its operation. The two float ropes were joined to the bridles by slipknot each of length 18 to 20 m and 12 mm in diameter and locally called so. Garfil ropes were used for *mosquito dol* net operation (Fig. 1).

Two thermocol rectangular shaped floats having size of 600x600 mm, locally called as *Boya* and five grapnel anchors each weighing 65 to 70 kg and locally called as *nagar* were used for mooring the net. The shank of the anchor was 120 cm long and 4 cm in diameter, locally called as *dandi*, the terminal part of the shank connecting the arms *i.e.* the crown was locally called *pawadi* and

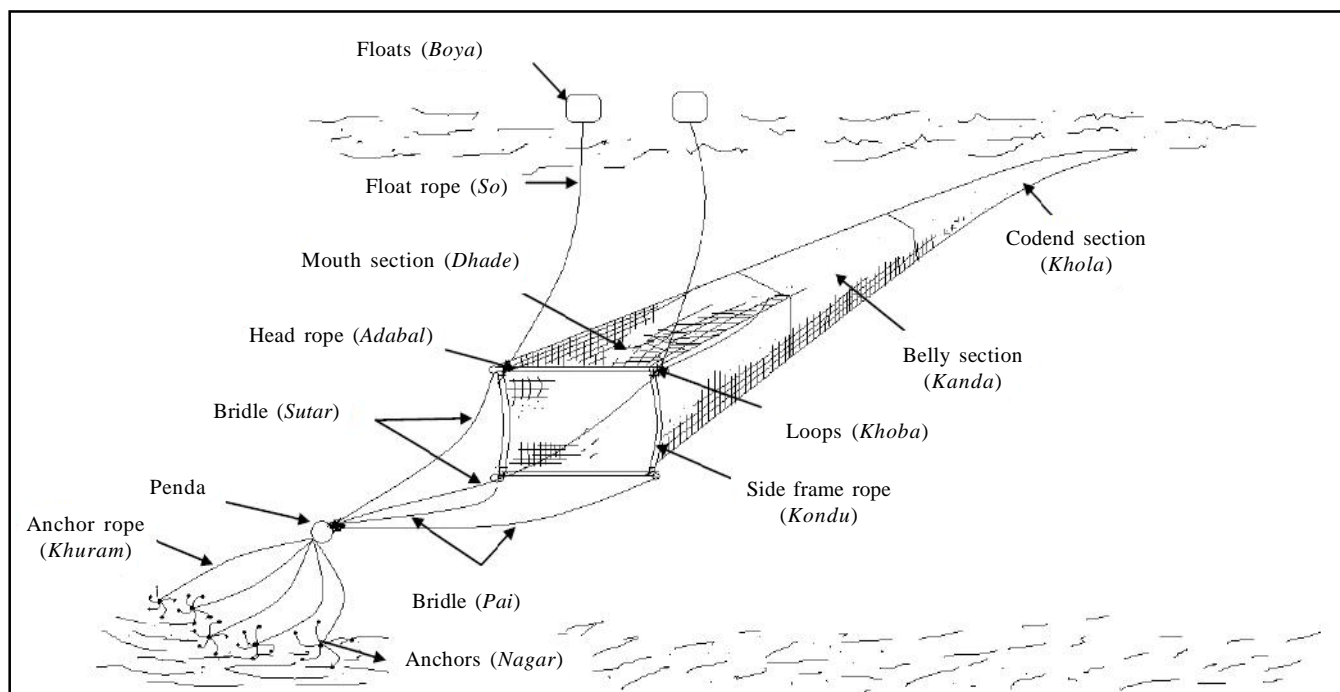


Fig. 1 : Mosquito dol net operated on Anchor (Nagar) in Ratnagiri

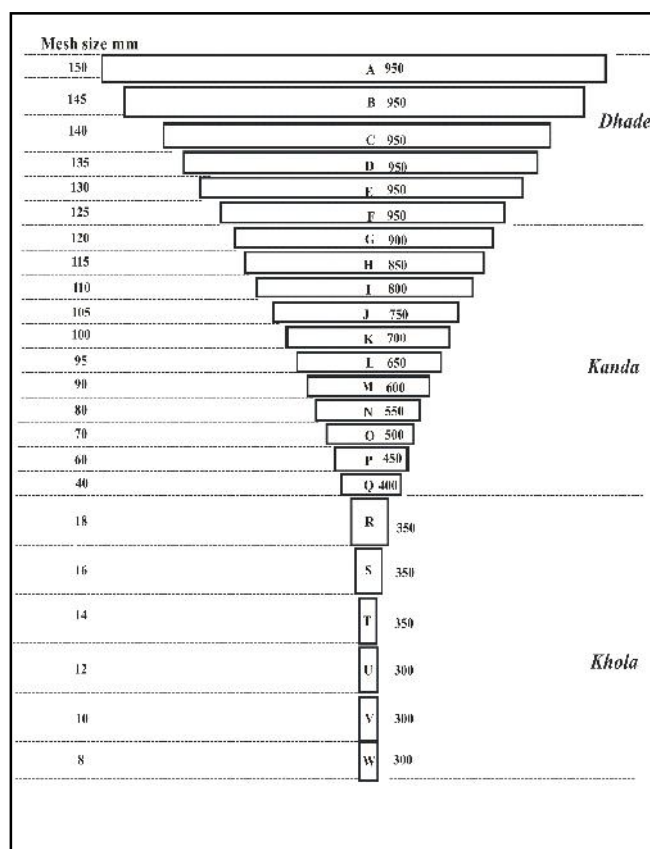


Fig. 2 : Design of Mosquito dol net operated in Ratnagiri

was 12.5 cm long with flukes of 20x20 cm. Anchors were tied to the net with the help of anchor ropes (*Khuram*), for providing strength and support to the *dol* net and holding it at one desired location.

Sehara and Karbhari (1987) reported that the *Khunt-sus*, *Khamba* or *Medha*, *Kaba sus* and anchor holding systems were used for *dol* nets operation in northwest coast of India. Josekutty and Sundaram (2004); Raje and Deshmukh (1989) and Raje and Ramamurthy (1990) reported that in Mumbai spike and anchor system was used for *dol* net operation.

The operation of *dol* net by *nagar* system was accomplished by 2–3 fishermen at a depth of 18 to 20 m in the creeks. After reaching the site, the fisherman cast off the anchors rigged with anchor ropes and rope bridle in such a way that the anchors were fixed in the muddy bottom of the creek, keeping a distance of about 7–8 m from one another. The actual operation involved fixing of net to the bridle so that it faces the tide, at its onset and hauling it before the change of tide. The anchors rigged with anchor ropes, rope bridle and float ropes

attached with thermocol marker floats were left anchored in the creek after completion of the operation. The thermocol marker floats floating on the creek waters thus indicated the specific site of the individual fishermen, where the *dol* net operation was carried out during the fishing season.

After reaching the fishing site, the bridle was located by means of marker floats. Then the rope attached to the float was pulled by the fishermen. The net was tied at the four corner loops (*Khoba*), to the bridle (*Sutar* and *Pai*) with the help of slipknot and the net was then paid by releasing the cod end after tying it with a small piece of rope by a rolling hitch. The net was allowed to drift for some time and then the net was set in the flowing water in the tidal current. The setting of the net required only 15–20 minutes. As the distance from the shore / jetty to the net operation site was less, fisherman returned to their homes along the bank of the creek after setting the net. They returned back to the site of operation for lifting the net before the change of tide.

One hour before the turn of the tide, the hauling operation was initiated by locating the marker floats and pulling the float ropes so to gain access to the bridle ropes (*Sutar* and *Pai*). When the end of the bridle ropes were pulled with a firm jerk, the bridle attached to the loops (*Khoba*) of the net was released. The head rope and foot rope of the net were then accessible which were hauled up immediately by the fishermen and then the entire net was lifted on to the boat. When the net was completely hauled up, the catch was emptied from the cod end section into the bamboo baskets and the net was again set in the opposite direction of water current. After reaching the bank of the creek the fish catch was sorted and sold locally. If the net was brought back by the fisherman, the net was washed in creek water and then the net was dried and arranged on the boat ready for the next operation.

Dol net operation was carried out by the dug-out-canoe fitted with 40 teakwood planks, locally called as '*Hodi*' or '*Depco*', having a thatched roof and fitted with one or two cylinder inboard engine having 5 to 7 horse power (hp). The overall length of the *Hodi* ranged from 4.5 to 7.0 m with an average 5.50 ± 0.10 m, whereas breadth ranged from 0.4 m to 2.1 m with an average of 1.10 ± 0.08 m and the depth of boat was 0.5 to 1 m with an average of 0.60 ± 0.02 m. The dug-out-canoe was fitted with one or two cylinder inboard engine having 5

to 7 horse power (hp).

Dol net fishing was carried out when the currents were strong enough to sustain the net *i.e.* from 11th day of lunar calendar till the 5th day of lunar calendar (from *Ekadashi* to *Panchmi*) after full moon and new moon. During this period, water level and water current were favorable for *dol* net operation. After 5th day of lunar calendar (*Panchmi*) they waited upto the 11th day of lunar calendar (*Akadashi*) of same month because during this period the tide and the currents were low which

were not suitable for *dol* net operation. The fish catch of the *dol* net consisted mainly of pony fish, acetes, dhoma, lesser sardine, crabs, ribbon fish, catfish and shrimps. The fish catch ranged from 5 to 10 kg to a maximum of 20 to 25 kg per operation.

The documented information on the technical specifications, design and operation of *Mosquito dol* net of Ratnagiri, would serve as a base line information for the technological modifications the net may undergo to increase its efficiency in the coming years.

Table 1 : Technical specifications of *Mosquito dol* net operated in Ratnagiri

Name of the Gear : <i>Dol</i> net																		Locality : Ratnagiri, Maharashtra, India										Vessel : OAL: 4.5 – 7.0 m													
Type : <i>Mosquito dol</i> net																		(5.50±0.10)																							
Webbing																																									
Webbing	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W																		
Local name	Dhade										Kanda										Khola																				
Material	High density polyethylene (HDPE)																																								
Knot type	Sheet Bend																																								
Preservation	Nil																																								
Colour	Blue																																								
Twine , mm	1.5																																								
Mesh size, mm	150	145	140	135	130	125	120	115	110	105	100	95	90	80	70	60	40	18	16	14	12	10	8																		
Upper edge	950	950	950	950	950	950	900	850	800	750	700	650	600	550	500	450	400	350	350	350	300	300	300																		
Lower edge	950	950	950	950	950	950	900	850	800	750	700	650	600	550	500	450	400	350	350	350	300	300	300																		
Depth, meshes	7	13	25	35	45	55	75	100	110	120	150	175	180	190	200	240	268	350	350	350	300	300	300																		
Baiting rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-																		
Cutting rate	All points																																								
Hanging co-efficient	0.50										0.20										0.51																				
Hung length of panel in m	0.52	0.94	1.75	2.36	2.92	3.43	1.8	2.3	2.42	2.52	3	3.32	3.24	3.04	2.8	2.88	2.14	3.21	2.85	2.50	1.83	1.53	1.22																		
Hung depth of panel in m	106.8	103.3	99.7	96.1	92.6	89.06	103.6	93.84	84.48	75.6	67.2	59.28	51.84	42.24	33.6	25.92	15.36	4.59	4.08	3.57	2.62	2.19	1.75																		
(a) Particulars of webbing																																									
(b) Particulars of ropes, lines and other accessories																																									
Ropes and lines		Head rope			Foot rope			Bridle			Float rope			Side frame rope			Anchor rope			Lacing twine for joining main webbing sections																					
Vernacular name		<i>Adabal</i>			<i>Adabal</i>			<i>Sutar, Pai</i>			<i>So</i>			<i>Kondu</i>			<i>Khuram</i>			--																					
Material		PP			PP			PP			PP			PP			PP			PE																					
Diameter (mm)		4			4			14			12			4			14			1.5																					
Length (m)		7.5-8			7.5-8			30-40			18-20			7.5-8			37.5			--																					
		(6.9+0.21)			(6.9+0.21)			(38.6+1.06)			(18.3+1.05)			(6.9+0.21)																											
(c) Particulars of floats and anchors																																									
													Floats							Anchors																					
Number								2																		5															
Material								Thermocol																		Iron															
Shape								Rectangular																		--															
Dimension, mm								600																		40															
Weight in air, Kg								3																		65															

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